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AFTER FINAL EXPEDITED
PROCEDURE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

4/12/01

Smith

In re the Application of:

Katsumi MIYATA et al.

Serial Number: **09/478,508**

Group Art Unit: 2814

Filed: **January 6, 2000**

Examiner: **GRAYBILL, D.**

For: **SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME**

AMENDMENT AFTER FINAL

BOX AF

Commissioner for Patents
Washington, D.C. 20231

April 4, 2001

Dear Sir:

In response to the Office Action dated December 13, 2000, please amend the above identified application as follows:

IN THE CLAIMS:

Please **AMEND** claim 13 as follows:

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13. (Twice Amended) A semiconductor device having a semiconductor chip,
first electrodes formed on said semiconductor chip,
barrier metals formed on said first electrodes and having laminated structures, and
a plurality of second protruded electrodes, which serve as external connection terminals,
formed on said barrier metals, wherein said barrier metals comprising:

a lowermost conductive metal layer laminated on said first electrodes, said lowermost conductive metal layer having a comparatively good joining property with said first electrodes;

an intermediate conductive metal layer laminated on said lowermost conductive metal layer, said intermediate conductive metal layer comprising one or more layers and having a comparatively good joining property with said lowermost conductive metal layer, said intermediate conductive metal layer having at least one layer serving as a barrier layer for preventing said protruded electrodes from diffusing into said intermediate conductive metal layer; and

an uppermost conductive metal layer laminated on said one or more intermediate conductive metal layers, said uppermost conductive metal layer being made of a material which easily alloys with the material of said intermediate conductive metal layers and which has good resistance to oxidation.

Please **ADD** the following new claims:

16. (New) A semiconductor device as claimed in claim 13, wherein said uppermost conductive metal layer is made of a metal selected from the group consisting of gold (Au), platinum (Pt), palladium (Pd), silver (Ag) and rhodium (Rh) or of an alloy containing a metal selected from the group consisting of gold (Au), platinum (Pt), palladium (Pd), silver (Ag) and rhodium (Rh).

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17. (New) A semiconductor device as claimed in claim 13, wherein the weight of said
uppermost conductive metal layer is less than 2 weight % of the weight of the bump to be formed
thereon.

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REMARKS

Claim 13, 16 and 17 are pending in this application. Claims 16 and 17 have been added and claim 13 has been amended. Reconsideration of the rejections in view of these amendments and the following remarks is respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment, which is captioned "**Version with Markings to Show Changes Made.**"

Request for Withdrawal of Finality of the Office Action

In the first Office Action, the Examiner rejected claim 13 only under 35 USC §112. In this second Office Action, the Examiner has made the action final rejecting claim 13 under 35 USC §102(b).

It is submitted, however, that the finality of the action is improper and should be reconsidered. The MPEP reads at 706.07(a) as follows (emphasis added):

A second or any subsequent action on the merits in any application or patent involved in reexamination proceedings **should not be made final if it includes a rejection, on prior art not of record**, of any claim amended to include limitations which should reasonably have been expected to be claimed. See MPEP §904 et seq. For example, **one would reasonably expect that a rejection under 35 U.S.C. 112 for the reason of incompleteness would be replied to by an amendment supplying the omitted element.**

Thus, the finality of the Office Action should be withdrawn

Rejections under 35 USC §102(b)

Claim 13 is rejected under 35 USC §102(b) as being anticipated by Cook (U.S. Patent No. 5,719,070).

Claim 13 has been amended for clarification. According to amended claim 13, the uppermost layer easily alloys with the material of the intermediate conductive metal layers and has good resistance to oxidation. With such an uppermost layer, the testing step can be implemented after the barrier metal forming step and before the protruded electrode forming step. It is believed that Cook does not teach or suggest the features of claim 13.

New Claims

New claims 16 and 17 dependent from claim 13 are added.

It is submitted that nothing in the cited references teaches or suggests all the features recited in each claim of the present application. Thus all pending claims are in condition for allowance. Reconsideration of the rejections, withdrawal of the rejections and an early issue of a Notice of Allowance are earnestly solicited.

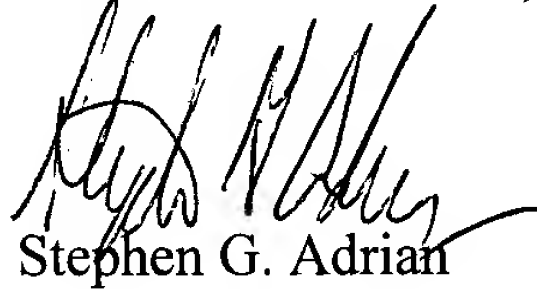
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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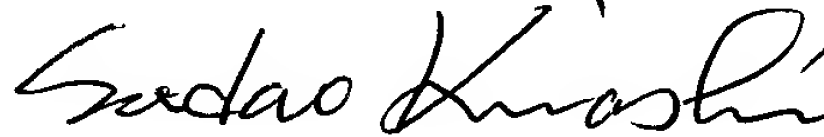
In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 01-2340.

Respectfully submitted,

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